

## **REMARKS**

### **I. STATUS OF THE CLAIMS**

Claims 42-57 were pending at the time of the Action. Claims 45, 50-52, and 57 have been amended. Claim 58 and 59 are new. The amendment to claims 45, 50-52 are for clarification purposes and do not alter the scope of the amended claims. Similarly, the SEQ ID NOs of the amino acid sequences of SCN1A were introduced in Claim 57. SEQ ID NO:3 and SEQ ID NO:4 show an aspartic acid residue (“D” in the one letter amino acid code) at position 188. In Claim 58, which depends on claim 57, the sequence of the codon “gtt” (encoding a valine) was introduced in place of codon “gat” (encoding an aspartic acid). The “a” at 828 in SEQ ID NOs:1 and 2 is the position of the disclosed “A565T substitution corresponds to a non-conservative amino acid change (D188V)” (at page 55, lines 14-15, for example). Thus, claims 57 and 58 find support in the specification and the sequence listing as originally filed. Support for claim 59 can be found at least on page 37, line 29. No new matter has been entered by way of the instant amendment. Claims 42-59 are now pending and under examination.

### **II. INFORMATION DISCLOSURE STATEMENT**

#### **Reference C10 filed with Information Disclosure Statement of October 11, 2006:**

Reference C10 has been crossed off by the Examiner because it was incomplete. Since AF035685 relates to SCN3A sequences and not to the elected SCN1A sequences, this sequence is considered immaterial to the patenting of the instant claims and is thus not resubmitted.

#### **Reference C15 filed with Information Disclosure Statement of January 29, 2007:**

As requested by the Examiner, relevant pages of reference C15 are being submitted in a Supplemental Information Disclosure Statement concurrently with this response. More

particularly, pages 1-12, 38-50 and 80-83 are being submitted together with the table of contents of the Journal.

Reference C17: Partial reference C17 was received from Examiner Sue Liu in an Office Action dated November 11, 2006, in related application No. 10/664,603. More particularly, the blast result submitted as reference C17 was provided by the Examiner with regard to comparison of SCN3A sequences (SEQ ID NOs: 72 and 73 of the instant sequence listing), which were considered as not sharing significant sequence similarity. Since the present application relates to SCN1A sequences, this reference is not resubmitted.

### **III. CLAIM OBJECTIONS**

Claim 45 has been objected to for lacking proper grammar. In light of current claim 45, this objection is moot.

### **IV. REJECTION UNDER 35 U.S.C. §112**

Claims 45, 50-52, and 57 satisfy the requirements of 35 U.S.C. §112.

Claim 45: Claim 45 is rejected as being ambiguous. Claim 45 has been clarified to read “wherein said test compound is comprised in a library of test compounds.” The rejection is moot.

Claim 50: Claim 50 is rejected as being ambiguous. The phrase “induction of a second cellular messenger” in claim 50 has been amended to read “induction of a cellular messenger.” The rejection is moot.

Claims 51 and 52: Claim 51 and 52 are rejected as being unclear due to a lack of antecedent basis for “flux of ions through the channel” and “said binding of molecules”

respectively. Claims 51 and 52 has been clarified and now depend from claim 50. The rejection is moot.

Claim 57: Claim 57 is rejected as being unclear. Claim 57 has been amended to include a reference sequence SEQ ID NO:3 or SEQ ID NO:4. The rejection is moot.

Withdrawal of all rejections under 35 U.S.C. §112 is respectfully requested.

## **V. REJECTIONS UNDER 35 USC § 102**

The Action rejects (a) claims 42-47, 49-51, 53-54 as allegedly anticipated by Reckziegel (1998); (b) claims 42-47, 49, 50, and 53 as allegedly anticipated by Tian *et al.* (1995); and (c) claims 42-47, 49, 50, and 53 as allegedly anticipated by Noda *et al.* (1987).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. MPEP § 2131 citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

### **A. Claims 42-47, 49-51, 53, and 54 are patentable over Reckziegel**

Claims 42-47, 49-51, 53, and 54 are rejected under 35 U.S.C. 102(b) as being anticipated by Reckziegel. Applicants traverse.

In order to be anticipatory, a reference must teach all of the claim limitations. Applicants note that Reckziegel does not describe the *selection of a compound* that reduces the activity of the sodium channel. In fact, Reckziegel does not describe a screening assay at all. Reckziegel describe a method of characterizing a sodium channel based on its reactivity with a toxin. Reckziegel use known sodium channel toxins tetrodotoxin and saxitoxin not test compounds. Therefore, no selection was performed by Reckziegel. Without a selection step Reckziegel fails

to describe all elements of the present claims and therefore cannot anticipate the claimed invention.

Also, as acknowledged by the Examiner, “Reckziegel is silent as to what the sequence of the sodium channels actually is.” (emphasis added) In fact the words "nucleic acids", "proteins" or "SCN1A" are nowhere to be found in this reference. Claim 42 recites particular sequences. Therefore, all the claim limitations are not taught by Reckziegel.

The Examiner states “it is reasonable that the tissue samples from Reckziegel comprise the protein of SEQ. ID NO:3...since the sodium channel 1-alpha protein is the main component of the channel (specification, p. 3).” Applicants respectfully suggest that this rejection is thus based on mere suspicions. It should be noted that the sodium channel family comprises at least 11 members (SCN1A-SCN11A; see for example: [en.wikipedia.org/wiki/Sodium\\_channel](http://en.wikipedia.org/wiki/Sodium_channel) on the worldwide web) that form complex tridimensional channels via interaction with up to 4 additional subunits (each). The fact that the alpha subunit of SCNA is the main component of the sodium channel, cannot and should not be translated into a teaching that a *particular sequence of a particular family member of the SCNA family* is “reasonably” present in a tissue sample. It appears much more conceivable that the tissue preparation of Reckziegel comprises different mixtures of channels and not only sodium channels.

It is thus more reasonable to believe that the hippocampal dentate granule cells preparation of Reckziegel also contain potassium channels (also comprised of many family members). In any event, Reckziegel does not teach a crude SCN1A preparation, it does not teach a crude cellular preparation, it teaches hippocampal tissue slices put on microscopic slides on which electrophysiological characterizations are performed not test compound selection.

Furthermore, Applicants respectfully submits that Reckziegel does not even satisfy the preamble of claim 42: “A method for selecting a compound which reduces the activity of a *SCN1A sodium ion channel* comprising.” The skilled artisan could not reasonably expect from Reckziegel that an observed reduction in sodium channel activity is due to a reduction of *SCN1A sodium channel activity*. Based on Table 1 of the webpage at [en.wikipedia.org/wiki/Sodium\\_channel](http://en.wikipedia.org/wiki/Sodium_channel), which only relates to sodium channels, 28 subunits thereof could be responsible.

Finally, the Examiner also states that “Once the PTO makes a *prima facie* case of inherency, the burdens shift to applicant to distinguish the claimed invention from the prior art”. Applicants believe that the above-submitted arguments have provided convincing evidence of clear distinctions between the alleged inherency of the prior art and the claimed invention. Nevertheless, Applicants stresses that in accordance with Oelrich, 666 F. 2d 578, 581, 212 USPQ 323, 326 (CCPA 1981) “When an anticipation is based upon inherency, however, the inherency *must be certain*, i.e., *the inherency may not be established by probabilities or possibilities*” [emphasis added].

Furthermore, in accordance with *Ex parte Cyba*, 155 USPQ 757 “In order that a rejection based upon inherency may be sustained *such inherency must be certain*” [emphasis added]. It follows that the hypothetical teachings of Reckziegel, which as admitted by the Examiner could perhaps contain SCN1A (“reasonable”), not only do not satisfy the certainty criteria of the jurisprudence, but are far from teaching all the limitations of claim 42.

In view of the above, Applicants respectfully request that the rejection of Claims 42-47, 49-51, 53-54 under 35 U.S.C. 102(b), in view of Reckziegel be withdrawn.

**B. Claims 42-47, 49, 50, and 53 are patentable over Tian *et al.***

Claims 42-47, 49, 50, and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Tian *et al.* The Examiner alleges that “Tian teaches contacting tissue from rats, which comprises central nervous system neurons, with candidate compounds. The reference *is silent with the sequences of the proteins contained therein*, ...As the tissue sample from Tian has sodium channels...” (emphasis added).

The Examiner is directed to the arguments above for overcoming Reckziegel. Indeed, Tian, which also uses tissue slices fails to teach all the limitations of claim 42 (e.g., “A method for selecting a compound which reduces the activity of a *SCN1A* sodium ion channel comprising”; and the recited sequences of SCN1A. In addition, and as previously presented, the certainty criteria is not respected, as it is impossible for the person of skill in the art to determine if indeed SCN1A is present and functional in the tissue slice and more important whether a reduction in sodium channel activity is due to a reduction of SCN1A alpha subunit activity or to another one of the numerous sodium channel subunits.

In view of the above and foregoing Applicants respectfully request that the rejection of Claims 42-47, 49, 50, and 53 under 35 U.S.C. 102(b), in view of Tian be withdrawn.

**C. Claims 42-47, 49, 50, and 53 are patentable over Noda**

Claims 42-47, 49, 50, and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Noda *et al.*, 1987, J. Receptor Res. 7(1-4): 467-497, and as evidenced by a sequence alignment attached to the Office Action. Current claim 42 is directed to “a SCN1A protein encoded by a SCN1A nucleic acid as set for the in SEQ ID NO:1 or 2.” The rejection is moot.

Applicants request the withdrawal of all anticipation rejections.

## VI. REJECTIONS UNDER 35 USC §103

The Action rejects (a) claims 42-51, 53, and 54 as allegedly being obvious over Reckziegel in view of Hartshorne; (b) claims 42-47 and 49-54 as allegedly being obvious over Reckziegel in view of Kienle; and (c) claims 42-47, 49-51, and 53-55 as allegedly being obvious over Reckziegel in view of Avanzini. Applicants traverse.

To establish a *prima facie* case of obviousness the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

### A. Claims 42-51, 53, and 54 are patentable over Reckziegel in view of Hartshorne

Claims 42-51 and 53-54 have been rejected under 35 USC 103 (a) as being unpatentable over Reckziegel in view of Hartshorne. In order “to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” MPEP § 2143.03. As set forth above and incorporated here by reference, Reckziegel fails to disclose or suggest (1) the nucleic acid of claim 42; (2) SCN1A and; of course fails to disclose or suggest (3) a screening assay or selection step using same. Similarly, while Hartshorne teaches the purification of sodium channels it fails to disclose or suggest the nucleic acids of claim 42. In addition it is impossible from Hartshorne to know which sodium channel has been purified. Therefore, the combination of Reckziegel and Hartshorne fails to disclose or suggest every element of the claimed invention.

**B. Claims 42-47 and 49-54 are patentable over Reckziegel in view of Kienle**

Claims 42-47 and 49-54 have been rejected under 35 USC 103 (a) as being unpatentable over Reckziegel in view of Kienle. The combination of Reckziegel and Kienle fail to disclose or suggest every element of the claimed invention. The defects of Reckziegel are not remedied by Kienle.

**C. Claims 42-47, 49-51, and 53-55 are patentable over Reckziegel in view of Avanzini**

Claims 42-47, 49-51 and 53-55 have been rejected under 35 USC 103 (a) as being unpatentable over Reckziegel in view of Avanzini. Avanzini fails to remedy the deficiency of Reckziegel. The combination does not disclose or suggest every element of the claimed invention.

In view of the above, Applicants respectfully request the withdrawal of all obviousness rejections.

**VII. CONCLUSIONS**

Applicants believe that the present document is a full and complete response to the Action dated April 16, 2007. The present case is in condition for allowance, and such favorable action is respectfully requested.



The Examiner is invited to contact the undersigned Attorney at (512) 536-3167 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,



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